Letting Renewables and Storage Compete in IRPs

Tyler Comings
Applied Economics Clinic
www.aeclinic.org
National Conference of Regulatory Attorneys
May 8, 2019

Key points

- Renewable energy and storage are increasingly becoming the go-to replacement resources
- There is economic pressure to pursue RE and storage, even in a low-gas price world
- But continued pressure from stakeholders and regulators is needed to allow RE and storage compete

Three IRP examples

- **Northern Indiana Public Service Company (NIPSCO)**
- **Consumers Energy in Michigan**
- **Duke Energy in North Carolina**

Northern Indiana Public Service Company (NIPSCO)

- Part of MISO wholesale market, with some access to PJM market
- Indiana has stakeholder process and IURC review—no evidentiary hearing
- NIPSCO 2016 IRP: four coal units would be retired and replaced—mostly with new gas
- Faced strong criticism for lack of transparency and not considering lower tech costs
- NIPSCO 2018 IRP (one year early):
  - ✓ Improved transparency and stakeholder engagement
  - ✓ Issued an all-resource RFP
  - ✓ Bids competed with existing resources

Applied Economics Clinic
Economic and Policy Analysis of Energy, Environment and Equity

Northern Indiana Public Service Company (NIPSCO)

- Its model selected only RE, DSM, MISO capacity market purchases and storage as replacement for retiring coal

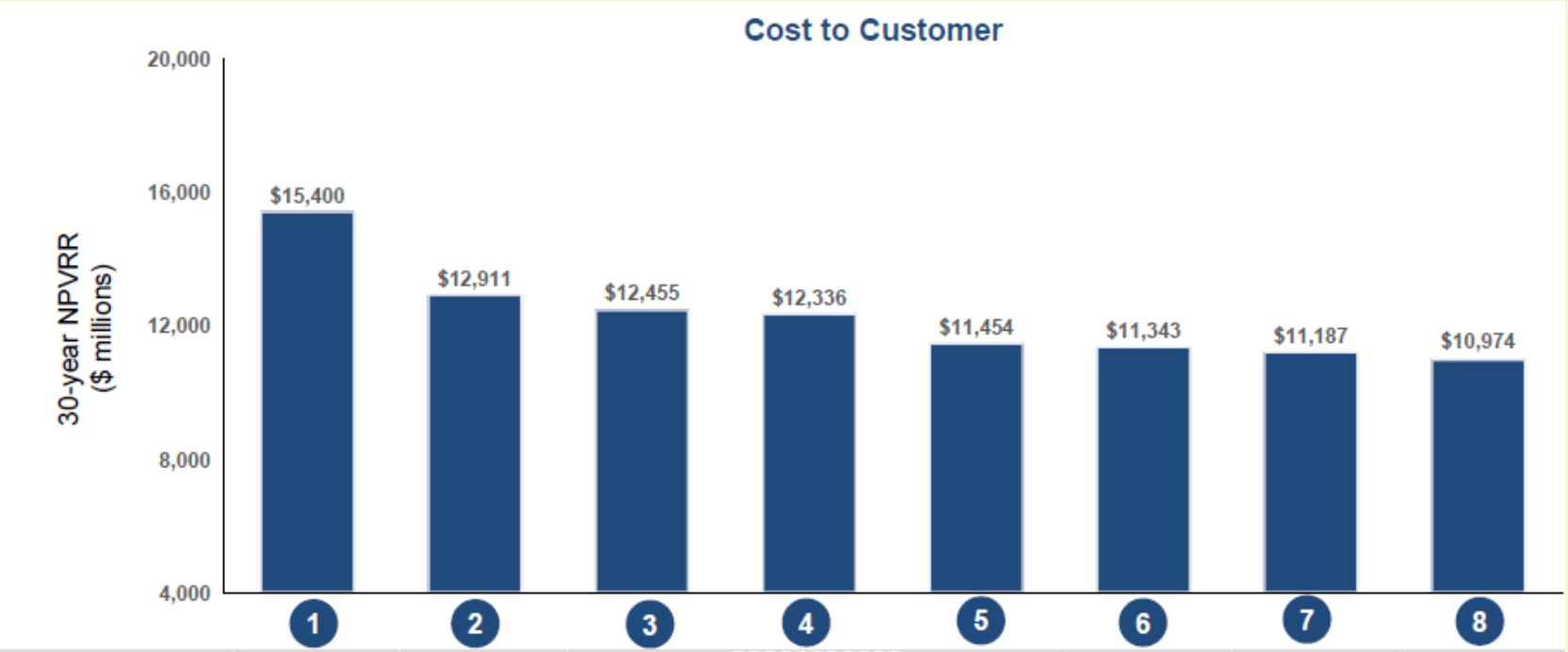
	2 3 4 Schahfer 17/18 Retirement ~600MW UCAP need		5 6 7 Schahfer 14/15/17/18 Retirement ~1,350MW UCAP need		8 All Coal Retirement ~1,750MW UCAP Need	
Higher	TECHNOLOGY	MW	TECHNOLOGY	MW	TECHNOLOGY	MW
COST-EFFECTIVENESS	MISO Market Purchase	50	MISO Market Purchase	50	MISO Market Purchase	50
	DSM	125	DSM	125	DSM	125
	Wind	150	Wind	150	Wind	150
	Solar, Solar + Storage	390	Solar, Solar + Storage	1,070	Solar, Solar + Storage	1,500
Lower		715		1,395		1,825

Applied Economics Clinic
Economic and Policy Analysis of Energy, Environment and Equity

Source: "NIPSCO Integrated Resource Plan 2018 Update: Public Advisory Meeting Five". Slide 27. October 18, 2018. https://www.nipsco.com/docs/default-source/about-nipsco-docs/nipsco-irp-public-advisory-meeting-october-18-2018-presentation.pdf

Northern Indiana Public Service Company (NIPSCO)

- Ratepayers saved more as coal was retired

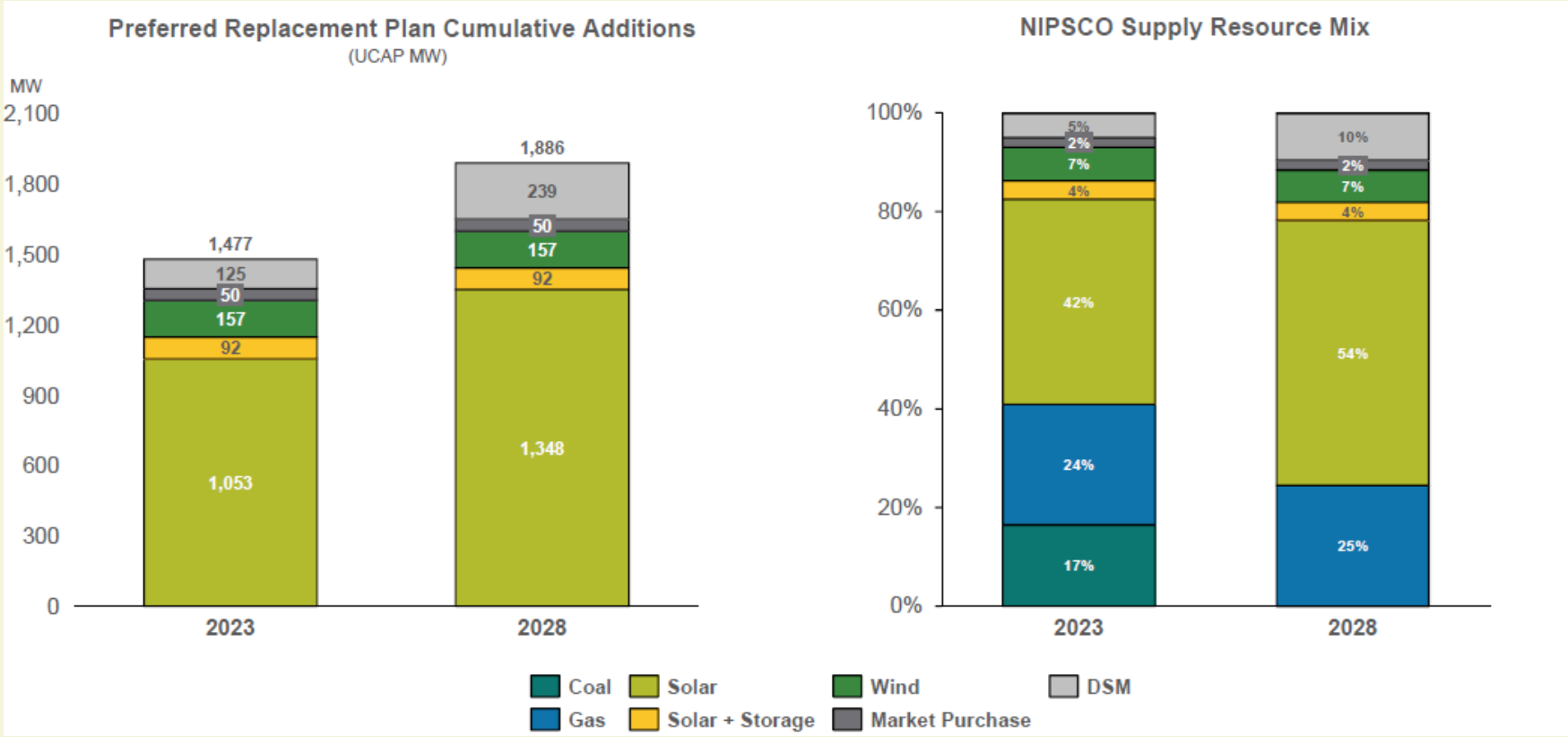


Portfolio Transition Target:	65% Coal through 2035	40% Coal in 2023	15% Coal in 2028 w/ ELG	15% Coal in 2028 w/o ELG	15% Coal in 2023 (MC 2035)	15% Coal in 2023 (MC 2028)	15% Coal in 2023 (17/18 2021)	0% Coal in 2023
Retire:	None	Schfr:17,18 (2023)	Schfr:17,18 (2023) Schfr:14,15 (2028)	Schfr:17,18 (2023) Schfr:14,15 (2028)	Schfr:17,18 (2023) Schfr:14,15 (2023)	Mich.City:12 (2028) Schfr:17,18 (2023) Schfr:14,15 (2023)	Mich.City:12 (2028) Schfr:17,18 (2021) Schfr:14,15 (2023)	Mich.City:12 (2023) Schfr:17,18 (2023) Schfr:14,15 (2023)

Applied Economics Clinic
Economic and Policy Analysis of Energy, Environment and Equity

Source: "NIPSCO Integrated Resource Plan 2018 Update: Public Advisory Meeting Five". Slide 28. October 18, 2018. https://www.nipsco.com/docs/default-source/about-nipsco-docs/nipsco-irp-public-advisory-meeting-october-18-2018-presentation.pdf

Northern Indiana Public Service Company (NIPSCO)

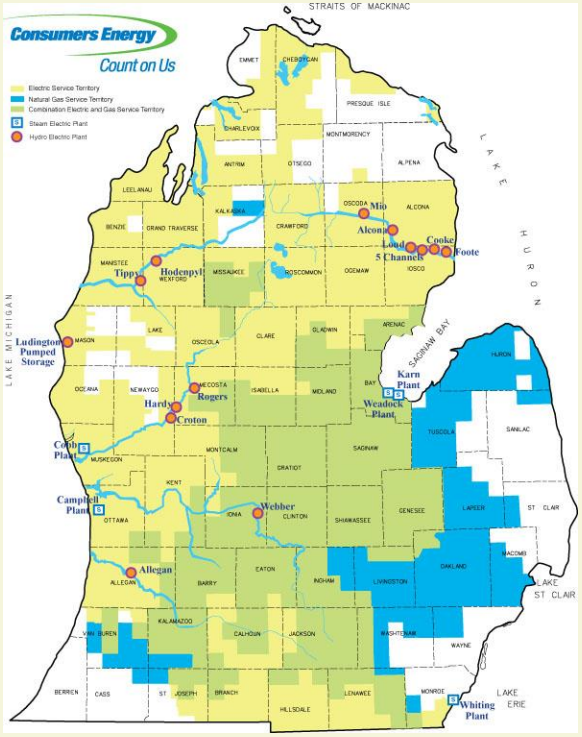


Applied Economics Clinic
Economic and Policy Analysis of Energy, Environment and Equity

Source: "NIPSCO Integrated Resource Plan 2018 Update: Public Advisory Meeting Five". Slide 51. October 18, 2018. https://www.nipsco.com/docs/default-source/about-nipsco-docs/nipsco-irp-public-advisory-meeting-october-18-2018-presentation.pdf

Consumers Energy in Michigan

- Michigan has some stakeholder meetings, testimony from other parties, and evidentiary hearing
- Faced strong pressure to evaluate Karn and Campbell coal units in past cases
- 2018 IRP:
  - ✓ Conducted modeling of new and existing resources together
  - ✓ Evaluated earlier retirement of Karn and Campbell units



Applied Economics Clinic
Economic and Policy Analysis of Energy, Environment and Equity

Consumers Energy in Michigan

- Consumers found that early retirement of Karn 1&2 (in 2023 instead of 2031) was lower cost

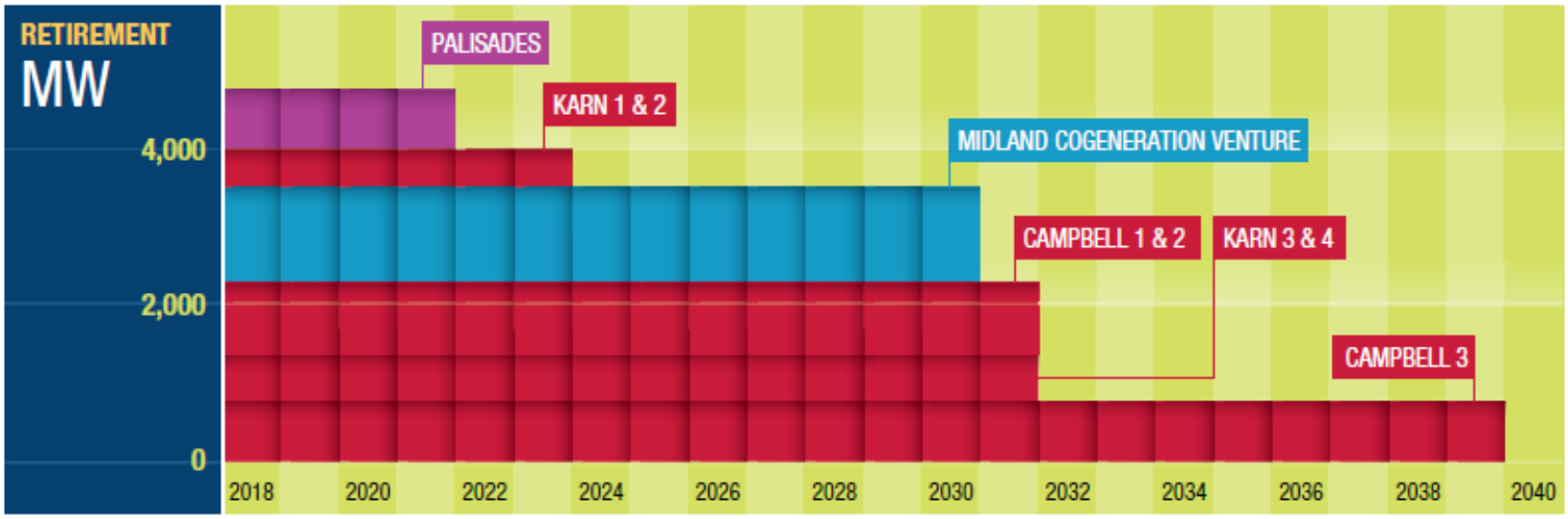


Figure 1.3: Long-term energy capacity plan – facility retirements

Applied Economics Clinic
Economic and Policy Analysis of Energy, Environment and Equity

Source: Consumers 2018 IRP, Executive Summary, p.5 (https://www.consumersenergy.com/-/media/CE/Documents/sustainability/integrated-resource-plan-summary.ashx?la=en&hash=9F602E19FE385367FA25C66B6779532142CBD374)

Consumers Energy in Michigan

- Consumers proposed adding 6,350 MW of solar and 450 MW of storage by 2040

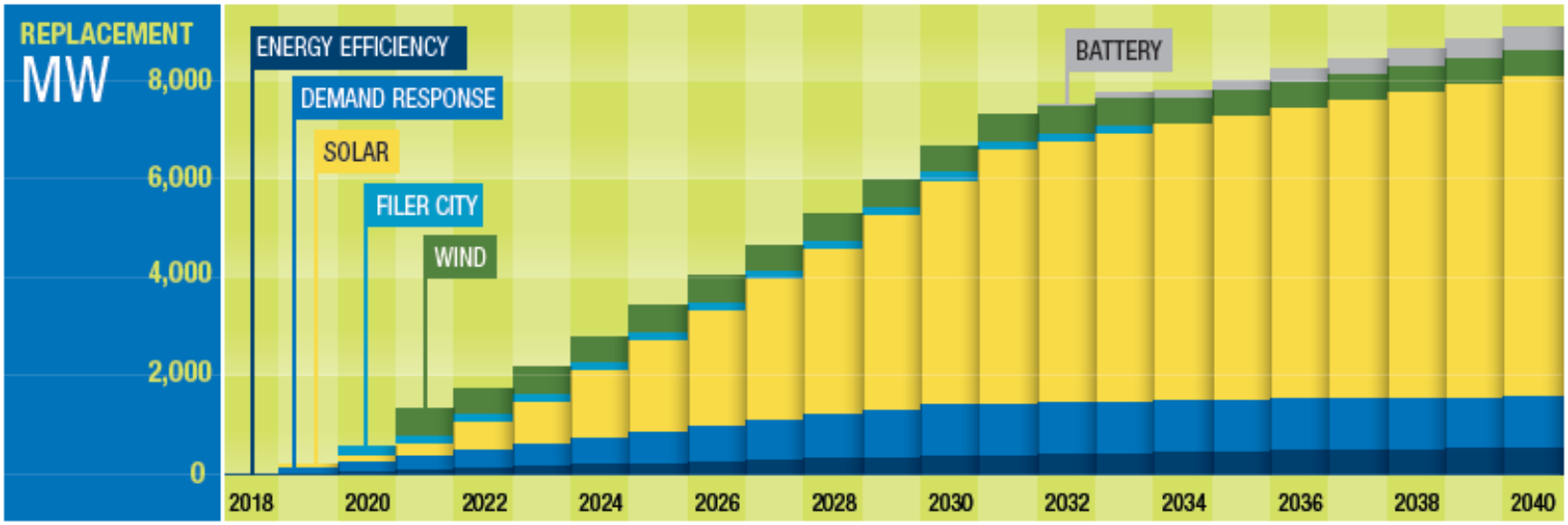


Figure 1.4: Long-term energy capacity plan – energy replacement

Applied Economics Clinic
Economic and Policy Analysis of Energy, Environment and Equity

Source: Consumers 2018 IRP, Executive Summary, p.5 (https://www.consumersenergy.com/-/media/CE/Documents/sustainability/integrated-resource-plan-summary.ashx?la=en&hash=9F602E19FE385367FA25C66B6779532142CBD374)

Consumers Energy in Michigan

The analysis still had key flaws:

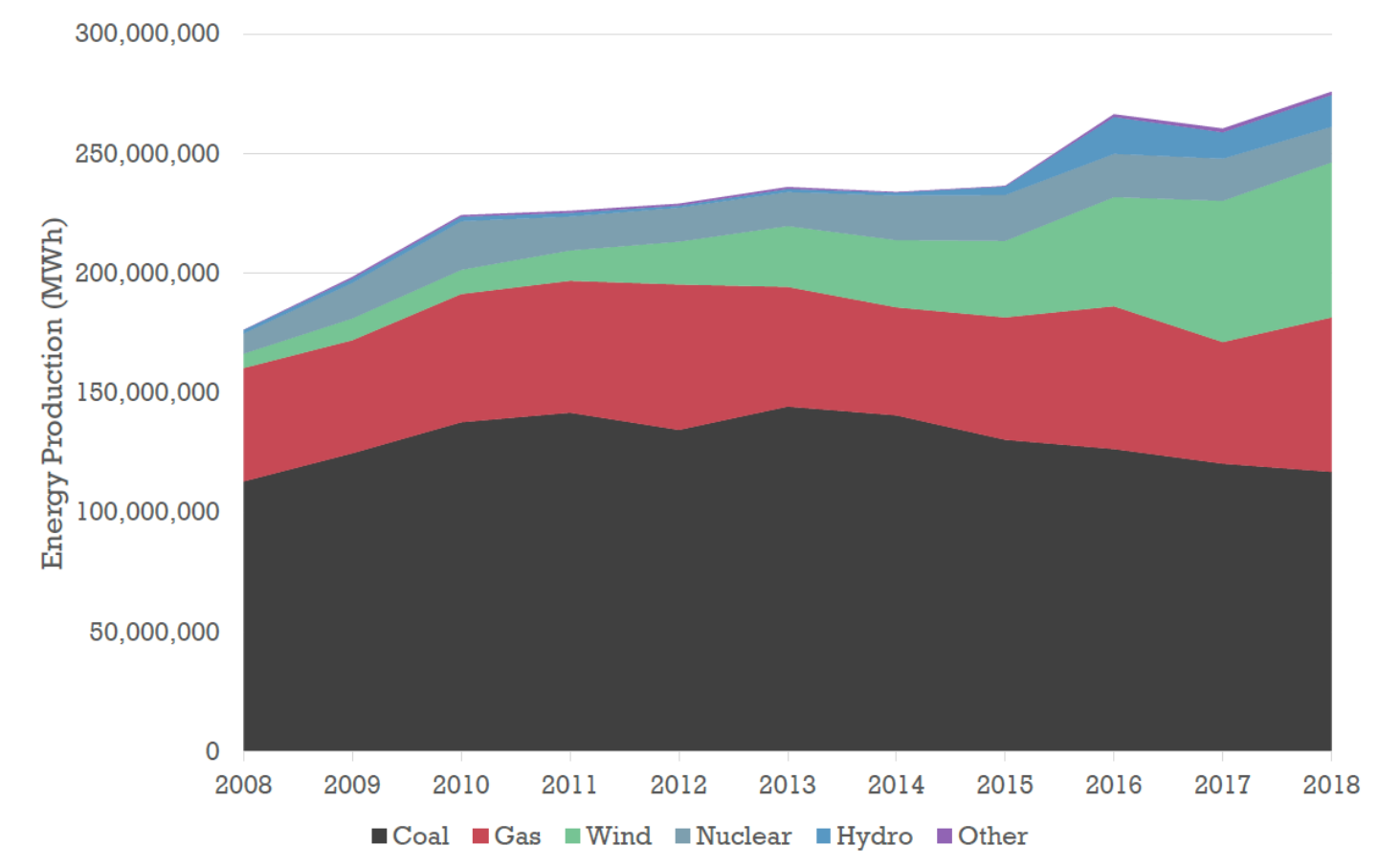
- Only looked at select retirement years
- Did not allow for market capacity replacement in short-term, despite low prices in MISO
- Did not adequately consider wind

Applied Economics Clinic
Economic and Policy Analysis of Energy, Environment and Equity

Source: Consumers 2018 IRP, Executive Summary, p.5 (https://www.consumersenergy.com/-/media/CE/Documents/sustainability/integrated-resource-plan-summary.ashx?la=en&hash=9F602E19FE385367FA25C66B6779532142CBD374)

Economic pressure in wholesale markets

Wind energy suppresses prices and displaces coal generation

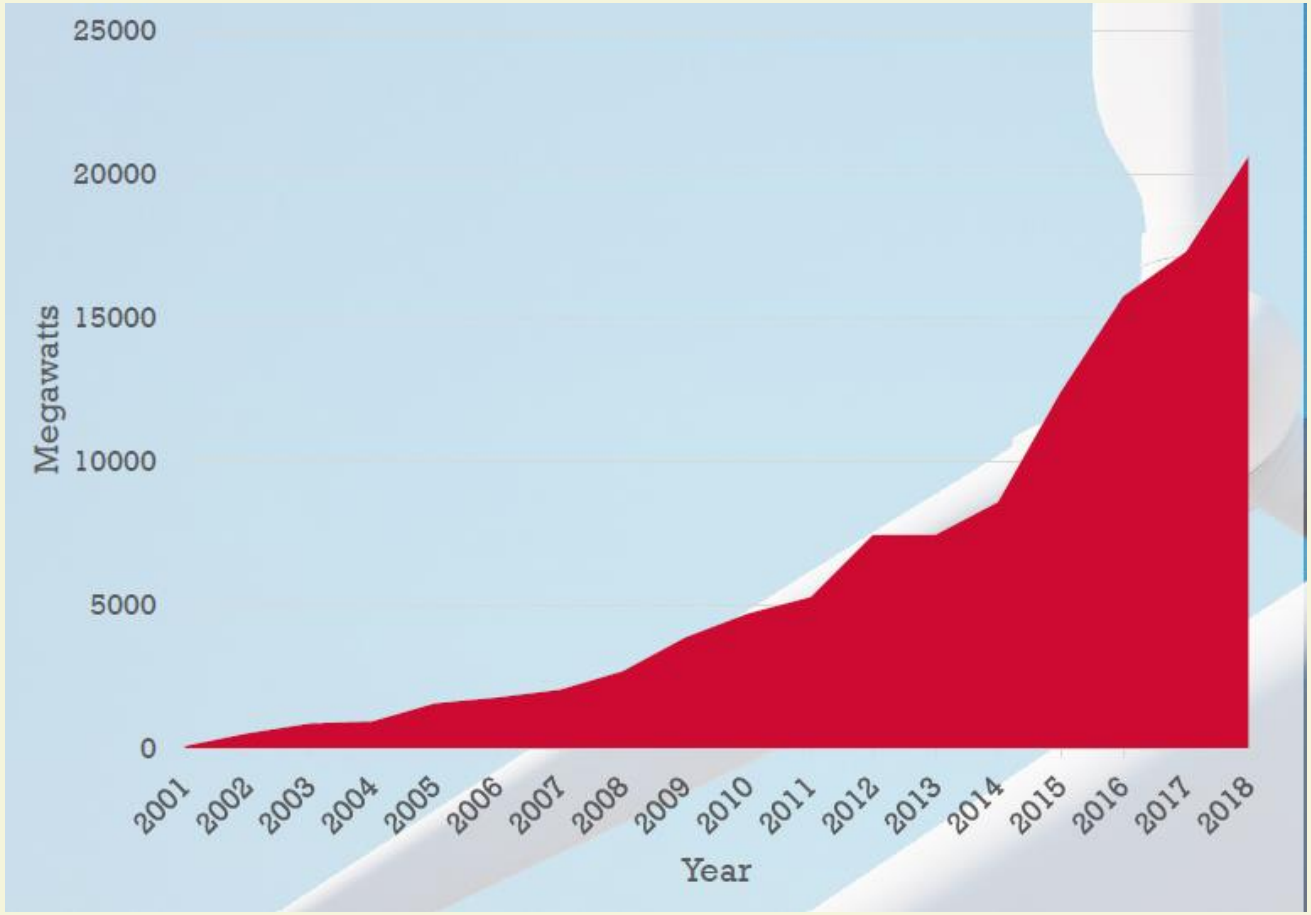


Source: SPP 101: Introduction to SPP, slide 25 (https://www.spp.org/documents/31587/intro%20to%20spp.pdf)

Applied Economics Clinic
Economic and Policy Analysis of Energy, Environment and Equity

Economic pressure in wholesale markets

Wind capacity is the most common new resource in SPP



Source: SPP 101: Introduction to SPP, slide 101 (https://www.spp.org/documents/31587/intro%20to%20spp.pdf)

Applied Economics Clinic
Economic and Policy Analysis of Energy, Environment and Equity

Economic pressure in wholesale markets

Barrier to RE and storage: they need to be allowed to compete on equal footing

- Wholesale markets were intended to provide more competition and lower costs
- But, coal and gas units can "self-commit" meaning they can run when uneconomic
- The ratepayers are subsidizing customers at-large
- Prevents the addition of more RE and storage, even if they were cost-effective

Non-RTO Utilities

- Can be virtual islands with little connectivity
- Not facing a large pool of competition means less economic pressure
- Tendency towards status quo
- Need strong regulatory and stakeholder pressure to look at alternatives to status quo

Duke Energy North Carolina

- Some of its coal units run as "peakers"—fleetwide it runs about a third of the time

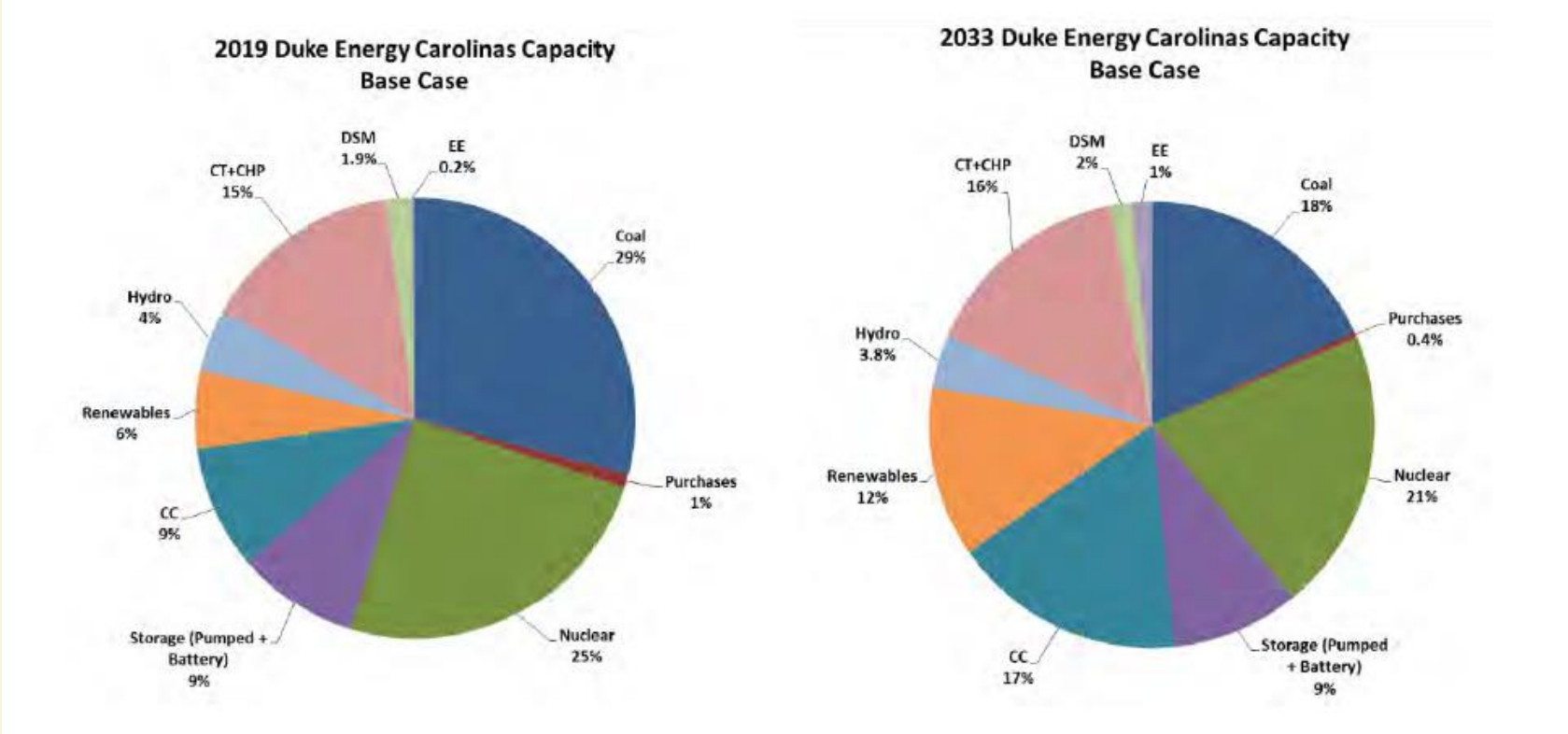
Coal Unit	2010	2011	2012	2013	2014	2015	2016	2017	2018
Allen 1	46%	29%	7%	4%	18%	12%	13%	6%	5%
Allen 2	41%	24%	5%	2%	16%	13%	15%	6%	6%
Allen 3	61%	46%	26%	26%	25%	16%	18%	9%	7%
Allen 4	59%	51%	31%	36%	27%	19%	12%	10%	7%
Allen 5	54%	41%	16%	17%	27%	18%	11%	16%	14%
Belews Creek 1	84%	80%	77%	58%	76%	62%	56%	40%	49%
Belews Creek 2	64%	81%	63%	68%	59%	67%	54%	59%	33%
Cliffside 5	51%	54%	23%	28%	29%	20%	16%	18%	26%
Cliffside 6				65%	63%	42%	39%	67%	58%
Marshall 1	58%	43%	32%	39%	54%	33%	40%	33%	29%
Marshall 2	52%	56%	41%	45%	60%	22%	29%	30%	20%
Marshall 3	74%	69%	56%	32%	75%	46%	68%	52%	55%
Marshall 4	83%	71%	67%	64%	22%	54%	61%	71%	64%
Mayo 1	76%	55%	54%	40%	40%	44%	31%	22%	23%
Roxboro 1	82%	54%	61%	44%	65%	45%	31%	26%	25%
Roxboro 2	67%	44%	71%	66%	57%	57%	48%	28%	32%
Roxboro 3	80%	59%	60%	39%	48%	33%	37%	36%	25%
Roxboro 4	72%	62%	66%	44%	69%	38%	35%	21%	27%
Capacity-weighted avg	**68%**	**61%**	**50%**	**48%**	**53%**	**43%**	**41%**	**38%**	**35%**

Applied Economics Clinic
Economic and Policy Analysis of Energy, Environment and Equity

Source: Review of Duke Energy's North Carolina Coal Fleet in the 2018 Integrated Resource Plans (https://static1.squarespace.com/static/5936d98f6a4963bcd1ed94d3/t/5c87e66ef9619a16319cec7d/1552410223239/AEC+comments+PUBLIC.pdf)

Duke Energy North Carolina

- Coal that is allowed to retire is replaced with gas



Applied Economics Clinic
Economic and Policy Analysis of Energy, Environment and Equity

Source: Duke Energy Carolina 2018 IRP, p. 68

Duke Energy North Carolina

Duke did not look for a lowest-cost solution

- Did not issuing an all-resource RFP
- Fixed coal retirements in modeling
- Made major resource decisions outside of IRP
- Failed to project fixed costs of existing units
- Little stakeholder engagement

Applied Economics Clinic
Economic and Policy Analysis of Energy, Environment and Equity

Source: EIA 923/860, excludes Asheville which is converting to natural gas. Data for 2018 is through October, latest available.

Lessons

Good planning needs to involve:

- Modeling new and existing resources against one another
- All-resource RFPs to encourage competition—look out for "hard-wiring"
- Stakeholder engagement, especially upfront
- Regulatory pressure for proactive planning and transparency